

# Climate Change in Doda District of Jammu and Kashmir

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## ABSTRACT

The industrial revolution of 1800s and the following modernisation have led to a sudden hike in the global temperatures over the years; the phenomenon is termed as Climate change. It has caused shifting of weather patterns to comparatively high temperatures and affected the regular life patterns on the earth. The existence of climate change is well evident in the history of earth, but the climate change before 1800s was usually naturally occurring disturbance in the earth's atmosphere which would regulate on its own. But Climate change today has a different meaning. It is wholly human induced destruction which is worsening the situation of the earth each day. The ever increasing human needs for a better and convenient lifestyle has costed the earth its health and the major driving factors being the fossil fuels combustion and deforestation. The need for energy production is increasing everyday which requires the burning of fossil fuels and thus the greenhouse gases are accumulated within the atmosphere of the earth at a huge scale which trap the incoming solar radiation and causing the heating of the earth. It leads to unusual and extreme weather events like heat waves, dry spells, cloud bursts, untimely rains, and decreased amount of snowfall.

**KEYWORDS:** Industrial revolution, Deforestation, Greenhouse gases, Fossil fuels

## INTRODUCTION

Given that its impacts are currently most noticeable, climate change is the phenomenon that the world talks about and defines the most. It is not a new incident; rather, it has a long history. On earth, there have been a number of climate change eras. The temperature would occasionally rise for a while before falling again. However, the climate change in the modern world is occurring at a faster rate and is largely caused by anthropogenic needs and activities. In the past, climate change was typically caused by naturally occurring atmospheric instability that would regulate on its own and was generally not a serious concern. It has caused the temperature to rise dramatically and at an unprecedented scale for the last century and hence it has become the greatest debated issue lately. The United Nations defines climate change as, "The long term shifts in temperature and weather patterns". This rapid rise in temperature leads to numerous hazards such as, it is a threat to the human life, it affects agricultural patterns, leads to rising sea levels and thus sinking of inhabited land, causes loss of biodiversity, desertification of cultivable lands, heat wave, cloud bursts, changed precipitation patterns, loss of ice caps etc. The global

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warming began in the 1880s after the industrial revolution came into picture and it has caused the global temperature to rise by 1.1°C since late 1880s. The warmest recorded decade has been the recent 2011-2020 with 2016 as the warmest year followed by 2020. This abrupt and on-going rise in temperature is due to the heavy emission of greenhouse gases in the atmosphere

## Effects of Climate change on Record:

The top ten producers of greenhouse gases, with India at the third rank, collectively contribute to 68% of the global emission of these gases; whereas the hundred least producing countries contribute to a total 3% of global emissions. The most pronounced effects of climate change are:

- As compared to the late 1880s, the earth is 1.1 degree Celsius warmer.
- The global sea levels have risen by about 8 inches (0.2m) since 1880.
- The Arctic ice caps have downturned by 95% in the past 30 years, melting at an alarming rate of 13% per decade. According to a report by the

Washington Post, “the earth is losing 1.2 trillion tonnes of ice every year”. On August 1 2019, Greenland alone lost 12.5 billion tonnes of ice in a single day. Antarctica is losing about 150 billion tonnes of ice per year.

- The frequency and intensity of tropical cyclones has increased enormously since 1980s.
- The frequency of heat waves has increased from an average of two per year in 1960s to a remarkable six per year during the last decade of 2010-2020, and so has increased the rate of cloud bursts and flash floods.
- The cropping season has increased due to increase in the frost free season, thus affecting the agricultural patterns and ecology

## STUDY AREA

Doda district is the third largest district after Leh & Kargil extending over an area of 11,691 sq. km. The district comprised of 654 inhabited villages, 07 tehsils namely Banihal, Ramban, Doda, Bhaderwah, Kishtwar, Thathri and Gandoh. Out of these tehsils, Kishtwar is the largest tehsil having area of 1644 sq. km. The district has 19 blocks namely Marwah, Warwan, Kishtwar, Inderwal, Padder, Thathri, Banihal, Bhalessa, Bhaderwah, Doda (Ghat), Assar, Bhagwah, Ramban, Ramsoo, Marmat, Gundana, Chatroo, Drabshalla and Nagesni. Urban area consists of 06 NAC's namely Bhaderwah, Doda, Batote, Kishtwar, Ramban & Banihal. The Doda district lies within latitude 32°25'00" and 34°14'00" N and 75°00" and 76°45'30" E. The area is rugged and mountainous and falls under two important tehsils, Ramban and Kishtwar of Doda district. The climate of the area is not uniform due to wide variations in altitude from place to place. The area, in general, enjoys temperate to sub-tropical type of climate. The climate of the district is almost dry. The rainfall is scanty. The temperature of the district varies from place to place. Ramban and Doda tehsils are fairly hot while as Padder, Marwah and Warwan remain snow bound for five-six months of the year. Summer is generally without rain and precipitation. The regions with elevations more than 1500 m above msl, experiences snowfall in the winter. The regions below 1000 m during summer months viz. from April to July are quite hot, but the winters are pleasant. The precipitation occurs either in the form of snowfall in higher regions and as rainfall in the lower regions. Monsoons prevail from July to September. Rainfall in the Doda district is heavy during July and September. The average annual rainfall is 926 mm and snowfall of about 135 mm.

## OBJECTIVES OF THE STUDY:

- To study the impact of global climate change in Doda district.
- To deduce methods to combat the threat of climate change through sustainable measures.

## METHODOLOGY:

The study is conducted to assess the impacts of climate change focused upon study area, taking into account the agriculture and environment and the sustainable development measures to combat it. It uses data from secondary as well as primary sources and a blended approach to summarise the data. Data from IMD, global climate change reports has been used to analyse the effects of climate change. Stratified random sampling, with a sample size of 10% has been used to collect the primary data. Moreover the data has been collected through interviews and questionnaire method. The farmers along with vehicle owners and other people of the town were included in the interviewing so as to avoid any error bases on biases and cover all the aspects.

## IMPACT OF CLIMATE CHANGE

The major impacts of climate change that Bhadarwah experienced in the past several years are:

1. **Wild Fires:** In context of the prolonged dry spells in Bhadarwah, the valley witnessed numerous wild-fires which inflicted massive damage to the ecosystem. These incidents have been most prominent in the past ten years. The major incidents are:
  - June 7, 2016, a fire broke out in the Thalela forest in Chirala area of Bhadarwah forest division.
  - October 19, 2017, the forests along the Seri area of Bhadarwah were engulfed in fire due to continued dry spell of over a month.
  - October 10, 2020, forests of Malnai area of Bhadarwah forest division were caught in fire.
  - January 21, 2021, Gurhaka block of the Kellar range in the Bhadarwah forest division was caught in massive fire such that it engulfed 3km area stretch from Malnai to Pranu.
  - March 30, 2022, fire broke out in the Chiralla range once again.
2. **Cloud bursts:** Cloud bursts have become more common in whole of Jammu & Kashmir during the last decade, ever since the temperatures started showing a rising trend. These are caused by accumulation of moisture in the atmosphere at a faster rate due to accelerated evaporation as a result of rising temperatures. More than 100 mm rainfall in one hour over an area of 20-30 km<sup>2</sup> is termed as a cloudburst. It may be followed by thunder and hailstorms. Bhadarwah forest division witnessed a devastating cloudburst on

July 9, 2022 in the Kahara region. According to a report by The Chenab Times, no loss of life was recorded however the disaster galloped a school building, seven residential houses, three grahats (traditional flour mills), a PRC building and a foot bridge. Another cloudburst hit Bhadarwah on July 20, 2022, but it was reported to have hit a nonresidential area in the upper reaches of the valley and hence no losses were incurred. However a loud sound was heard in the town.

3. **Heat waves:** A continued period of temperatures higher than usual and expected in an area is termed as heat wave. According to a report by The Chenab Times, “Jammu and Kashmir is one of India’s top five states/UTs experiencing heat waves, and the situation in these areas is deteriorating by the day”. Bhadarwah recorded the highest temperature in its history, touching 35.6 Celsius in June 2022 followed by the month of July having 31.9 Celsius temperature. However a heat wave was experienced in mid-May as well (32.5°C).
4. **Crop Failure:** The recurring heat waves and dry spells have reduced the water for irrigation, lowered the ground water table, lead to loss of soil moisture and thus degraded the soil health. Consequently the crop health has been affected. There have been shifts in the rainfall periods which have caused failure in seed germination and fruiting. The early rains and snowfall in Bhadarwah and other apple growing areas in J&K caused heavy damage to the apple crop which is among the main assets of farmers in the region. The apples acquire diseases such as blights at an early stage and fall off the tree, said a farmer Shahida Begum. She added that the untimely and heavy rains caused the corns to fall off the plants way before the ripening period and thus huge losses were incurred. The heavy and erratic rains also damaged the paddy crop this year, said another farmer Rafiq Begum. Moreover the detrimental climate change has disturbed the

usual cropping patterns. The leafy vegetables are eaten away by the pests and locusts.

5. **Rapid melting of snow:** In the past ten years snow has been melting much rapidly than before. The snow on Son-Baien (Ashapati glacier) has almost disappeared

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